The Citrus Industry

FLORIDA'S EXCLUSIVE CITRUS MAGAZINE...

The Citrus Situation Past, Present And Future

by Jefferson Thomas

The Mineral Composition Of Citrus Juice As Influenced By Soil Treatment

by B. R. Fudge

Develop Finer Fruit And Avoid Non-Profit Crops

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When the Trees "Rest"

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The Mineral Composition of Citrus Juice

As Influenced By Soil Treatment

By B. R. FUDGE
Associate Chemist, Citrus Experiment Station, Lake Alfred, at Meeting Fla. State Horticultural Society

There has been considerable emphasis placed on the mineral content of fruits and vegetables with regard to both human and animal nutrition. This discussion has led to considerable speculation concerning the effects of soils and fertilizers on the mineral composition of the edible portions of plants and by inference has led to the assumption that the mineral content of fruits can be varied to almost any extent. While it may be possible to "mineralize" to a small degree the edible vegetative parts of some plants, there is little or no factual evidence that the mineral content of citrus fruit juice of a given variety can be changed beyond very narrow limits. On the other hand, the effects of soils and fertilizers on the color and sugar and acid content as well as the general quality of the fruit have received considerable attention (1). It is generally recognized that there is less difference in the mineral analyses of foliage from plants grown on two widely different soils than there is between the soils themselves and that the difference is further reduced when fruits are compared. As a consequence, there is a question as to whether or not soil nutrient differences can be reflected in fruit sufficiently to make fruit produced on one soil superior in mineral composition to that from another soil even though differences in foliage composition can be demonstrated.

This paper will attempt to show to what extent the mineral content of citrus juice can be varied by soils and fertilizers. Incidental to the discussion, data on foliage composition are also presented in order to show the extent to which the composition of vegetative parts may be changed with or without changing the fruit composition.

Data

Following a survey of soils in citrus groves by Dr. Peech (2), about fifty groves were selected having soils which varied widely in analysis. Foliage and fruit from these groves were analyzed. Upon the basis of the calcium content and for convenience in presenting this paper, these analyses are divided into two broad groups; namely, those from groves on hammock soils which are high in calcium and those from groves on sandy soils which are comparatively low in calcium. From the data on the soils in these groves, shown in the first part of Table 1, it will be noted that the hammock soils have a higher exchange capacity and contain much more calcium, magnesium, and potassium than the sandy soils. The very high calcium content is a reflection of the fact that most of these soils are underlain with calcareous material which is often included in the mound on which the trees are grown. The only element that is present in the hammock soils in lesser amounts than in sandy soils is acid soluble and water soluble phosphorus which is probably due to the alkaline condition of the hammock soils and to the application of greater quantities of phosphatic fertilizers to the sandy soils which in the reverted state is more readily extracted by a weak acid solution.

The foliage from trees growing on hammock soils (Table 1, Part 2) contains a much higher proportion of ash in the dry matter which undoubtedly is the result of the greater supply of minerals in these soils. However, this higher percentage of ash results almost entirely from the greater percentage of calcium since the foliage from trees on sandy soils contains significantly more potassium and a little more magnesium and phosphorus. It is apparent that in hammock soils the higher calcium content repressed the absorption of magnesium and especially potassium even though they were present in relatively larger amounts, while on sandy soils the low calcium level was conducive to greater absorption of these elements. Many investigators have found that the content of any element in plant tissue may be directly or inversely related to the concentration of other elements in the soil or other substrata.

The difference between the phosphorus content of the foliage from trees on hammock soils and those growing on sandy soils is so small as to be considered within the range of experimental error. Conequently, there is no definite correlation between the phosphorus content of the soil as determined by Peech (2) and the phosphorus content of the foliage. It is entirely possible that this method does not measure the actual availability of phosphorus in calcareous hammock soils.

The nitrogen content of the foliage from groves on sandy soils is definitely higher than that from hammock groves. This is probably a reflection of the generally greater use of fertilizer on the sandy soils. Although nitrogen is not a mineral, the results are presented here as one of the important differences noted in the foliage composition.

The analysis of the juice from fruit taken from these groves is shown in the bottom section of Table 1. As might be expected, the differences are much smaller than the differences found in the soil or foliage composition. The calcium content of the juice from fruit grown on hammock soils was significantly higher than that of the juice from fruit on sandy soils but not by the large margin found in the foliage. Potassium was slightly higher in the juice from fruit grown on sandy soils, whereas the phosphorus and magnesium contents were about equal. Therefore, fruit from hammock groves could not be considered as having any great advantage in animal nutrition as far as the mineral content is concerned. While there is a small margin in the amount of calcium, an element which is considered very important in nutrition, the difference is so small in consideration of the amount of fruit juice consumed as to be insignificant. Thus, the consumer would obtain about .023 grams of calcium in an eight ounce glass of juice from oranges grown on hammock soils and about .017 grams from the same amount of juice from fruit grown on sandy soils.

Having completed the comparison of the mineral content of the juice from fruit grown on soils of widely different composition, we may now compare the effects which different sources of calcium and magnesium

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The Citrus Situation--

Past, Present and Future

BY JEFFERSON THOMAS
Farm Hour Newscaster

Citrus shipments from Lee county are unlikely to start before the first week in October, Farm Agent Carl P. Heuck discloses, and he predicts output ten per cent smaller than last season's. Cars will hardly begin rolling out of Manatee during September, Domino Growers Association Manager W. O. Kirkhuff reporting light grapefruit and tangerine crops with oranges about normal. Fruit may be expected to commence moving from somewhere in the state before long, however, and almost any day these chronicles may record the initial rail dispatches. Motor trucks almost certainly may be depended upon to carry away loads even sooner.

Producers who still believe that the trucks increase distribution of Florida fruit would do well to read George R. Williams' story in the last "Citrus" magazine concerning the results through the territory centering at Greensboro, North Carolina.

Maturity laws will be enforced to the letter this fall, State Agriculture Department Supervising Inspector George S. Copeland has asserted, and recently Governor Spessard L. Holland reappointed the nineteen field men comprising the force. Orlando Morning Sentinel editors have been calling on the members of the Florida Citrus Commission to turn handsprings in connection with the green fruit menace.

Worries that Chairman T. B. Swann and associates have also include the task of spending a million dollars for advertising so it will produce results that tax-harrassed growers can perceive and accordingly part with their assessments cheerfully.

Committeemen functioning under the federal marketing agreement for Florida citrus, from Growers Advisory Chairman Harry L. Askew on down the line, have acquired headaches trying to figure out what if any shipping restrictions they should seek through the Great White Father at Washington City. Conditions changing hourly in the National Capitol render it uncertain what the federal attitude will be concerning wrapping paper, packing house supplies and motor fuel that may have to come from war-shrunken reserves. Congressman J. Hardin Peterson nevertheless believes that better years are ahead for the state's citrus activities, because of Uncle Sam's growing friendliness. Army purchases totalling more than three hundred carloads, to be made for consumption during the October and November maneuvers in the Carolinas, will include ninety-two cars Florida oranges and seventy of her grapefruit for the latter month, Fourth Corps Area Quartermaster officers announced at Atlanta recently.

Grapefruit shipped by Puerto Rico and the Isle of Pines have been giving the New York City territory excessive quantities and prices broke correspondingly but still stayed higher than for the like periods last Fall. California Valencias movement is reasonably well regulated and the fruit remaining apparently does not threaten the current auction averages. Melons, peaches and like crops are so plentiful they continue giving citrus serious competition. After everything except apples has pretty well disappeared, the Florida grapefruit, orange and tangerine growers should inherit the markets and the fullness thereof.

Labor is receiving wages higher than ever before paid, creating a tremendous buying power, and unemployment has been greatly reduced, as Citrus Exchange General Manager C. C. Commander found on his recent trip through leading trade centers. Florida production of all varieties will fall well below that for either of the last two years. The Citrus Industry forecasts.

Warnings against rushing unripe stuff into distribution have been voiced by many industry leaders, one of the most emphatic coming from the Waverly Growers' Cooperative head, John D. Clark. President George S. Fullerton and other officials serving Florida Citrus Growers, Incorporated, have had their say along the same line. Rumors persist that the shippers composing the Citrus Producers Trade Association plan some drastic steps toward policing their chiseling competitors but Chairman A. S. Herlong, Senior, and Secretary-Manager Marvin H. Walker so far have kept silent in all the seven pro-

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THE MINERAL COMPOSITION OF CITRUS JUICE AS INFLUENCED BY SOIL TREATMENT.

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have produced in plots on Norfolk sandy soil at the Citrus Experiment Station. The materials and some of the rates of application used are given in Table 2. Thus, there are two quantities in the normal range of field application and one abnormally large application, all of which may be compared with the check (zero) treatment. The rates of application are shown in pounds per acre, pounds per tree, and also in the corresponding amounts of the actual elements added per tree. The experiment was started in the spring of 1937 and four annual applications of the materials have been made during the first two weeks of February.

The data on soil composition which were obtained from samples taken just prior to the fourth application of materials, show the effects accruing from the applications made in February of each of the three previous years. The average check soil condition shows about 380 pounds of calcium and 9 pounds of magnesium per acre in the surface (0 to 6 inches) soil and a pH value of about 5.0. The effect of calcium carbonate upon a soil in this condition has been to increase the exchangeable calcium and raise the pH value in proportion to the rate of application. Although there is a slight rise in the exchangeable magnesium, which is probably due to impurities in the ground limestone, the amount is negligible and not in proportion to the increase in calcium. As a consequence the ratio of calcium to magnesium in the soil is widened with each increase in application of calcium carbonate.

Since dolomite contains both calcium and magnesium, the results show an increase of both elements in the soil, an increase in the pH value, and a change in the calcium-to-magnesium ratio which decreases as the rate of application increases. Herein lies one of the chief advantages in the use of dolomite over calcium carbonate as a basic material.

Magnesium carbonate was applied at a lower rate but due to the high magnesium content (25 percent) the actual amounts of magnesium applied per tree covers a range somewhat greater than that of dolomite. Since there is a rise in the pH value, the increase in exchangeable calcium where magnesium carbonate is applied probably comes from the calcium sulfate contained in superphosphate (3). Large applications of magnesium carbonate have increased the exchangeable magnesium to such a level that the ratio of calcium to magnesium is approximately 2 to 1 while the ratio in the checks is approximately 45 to 1.

Applications of magnesium sulfate have not produced any appreciable accumulation of exchangeable magnesium in the soil. Likewise, there has been no increase in the pH value or any accumulation of calcium as in the case with magnesium carbonate.

The effects of these materials upon the composition of orange and grapefruit foliage are shown in Table 3 for the same year as that covered by the soil analyses. These data on foliage composition may be compared with each individual check (no treatment) or with the average of the four checks given at the bottom of Table 1.

The absorption of calcium from the soil has been slightly increased where the larger applications of calcium carbonate were applied to oranges. There has been no increase of calcium in the grapefruit foliage even though the supply of exchangeable calcium in the soil has been greatly increased (Table 2). Data on samples taken the previous year show no increases in calcium with either variety. The magnesium content of these samples is not appreciably altered and reflects the low supply of exchangeable magnesium in the soil. The few samples of both oranges and grapefruit which show any increase in calcium also show a corresponding decrease in magnesium. The physical condition of the trees receiving calcium carbonate, like that of the check trees, is very poor due to the development of severe magnesium deficiency in the fall, causing the loss of most of the foliage. The best explanation for the poor condition of these trees is the low available supply of magnesium in the soil.

The calcium content of foliage from trees receiving dolomitic limestone is lower than that from the checks for both oranges and grapefruit even though the soil data (Table 2) show a progressive increase in exchangeable calcium with the increase in applications of dol-

TABLE 1

A Comparison of the Average Composition of the Soil, Foliage, and Juice as Found in a Survey of Groves on Widely Different Soil Types.

Soil	Exch. Cap.	Base Sat. %	lbs. per acre-six-inches of soil				
			Ca	Mg	K	Acid Sol. P	Water Sol P
Hammock	11.7	85	3600	291	168	37	3
Sandy	3.5	62	764	54	99	591	16
Difference	8.2	23	2836	237	69	554	13

Foliage	Ash	Percent of Dry Matter				
		Ca	Mg	K	Total P	Total N
Hammock Soil Groves	18.1	5.61	0.318	1.36	0.155	1.96
Sandy Soil Groves	12.4	3.09	0.336	2.26	0.184	2.78
Difference	5.7	2.52	.018	0.90	.029	0.82

Juice	mg. per 100 ml. Juice				
	Ca	Mg	K	Total P	Total N
Hammock Fruit	10.4	9.9	191.1	17.0	88.2
Ridge Fruit	7.7	10.2	212.5	16.6	99.3
Difference	2.7	0.3	21.4	0.4	11.1

omite. The apparent decreases of calcium in the foliage are accompanied by a significant increase in the magnesium content over that of the checks. Likewise, the physical condition of the trees receiving dolomite is much improved over that of the checks.

The results obtained where magnesium carbonate is applied are similar to those observed where dolomite is used in that there is a reduction in the absorption of calcium and a somewhat greater increase in the absorption of magnesium. The greater supply of exchangeable calcium where dolomite is used combined with the relatively greater supply of exchangeable magnesium where magnesium carbonate is used undoubtedly explains the differences in the absorption of magnesium from these two sources. A point of interest in this connection is that the sum of the bases, calcium plus magnesium, found in the foliage is actually decreased by applications of either dolomite or magnesium carbonate. These data, as well as those of Table 1, illustrate the influence which one element (ion) may have upon absorption of another by the plant.

The applications of magnesium sulfate have not influenced calcium absorption by either orange or grapefruit foliage except possibly the very large applications which caused a slight reduction in the absorption of calcium. Although there has been no accumulation of magnesium in the soil (Table 2), it is apparent that efficient absorption of magnesium has resulted from the use of this material as indicated by foliage composition. When compared on the basis of equivalent magnesium applied, absorption from magnesium sulfate has been greater than from either dolomite or magnesium carbonate. Since the exchangeable calcium is lower than that resulting from the use of either dolomite or magnesium carbonate, the calcium balance is lower and greater ease of magnesium absorption occurs.

The extent to which the changes produced in the composition of the soil and foliage by different sources of calcium and magnesium have altered the mineral and nitrogen composition of the juice is shown in Tables 4 and 5. The amounts of nitrogen, phosphorus, potassium and calcium found in the fruit juice shows no definite influence that may be attributed to the effects of soil treatments which have produced great changes in the ratio and magnitude of the exchangeable bases. The variations in composition found with each treatmeat are not sufficiently greater than those of the checks to be considered as significant effects.

The large supply of exchangeable calcium in the soil resulting from the soil treatments with calcium carbonate and dolomite is not reflected in the calcium content of the juice. Therefore, these data are in agreement with those of Table 1 in showing that the amount of calcium in the soil has very little effect upon the amount found in the juice. In any case the amount present in the juice is too small to be of consequence.

The amount of magnesium found in the juice of both oranges and grapefruit does appear to be increased to a considerable extent where there is a large supply of exchangeable magnesium in the soil which is reflected in a high magnesium content in the foliage. There has been no increase in the magnesium content where calcium carbonate was

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TABLE 2
Effect of Different Sources of Calcium and Magnesium Upon the Amounts of These Elements Found in the Soil.

Material	Annual Treatment				lbs./Acre Found in Soil Feb. 5, 1940		
	lbs./acre Applied	lbs./tree	Ca/tree	Mg/tree	Ca	Mg	pH
CaCO3	0	0	0		393	9	5.0
	400	5.6	2.18		575	12	5.7
	800	11.2	4.37		805	13	6.2
	3200	44.8	17.47		1740	20	6.9
Dolomite	0		0	0	438	9	5.1
	400	5.6	1.12	0.56	542	37	5.4
	800	11.2	2.24	1.12	632	69	6.0
	3200	44.8	8.96	4.48	930	121	6.6
MgCO3	0	0		0	336	8	5.1
	200	2.8		0.70	446	22	5.3
	400	5.6		1.40	465	38	5.5
	1600	22.4		5.60	600	286	6.9
MgSO4	0	0		0	355	8	4.9
	100	1.4		0.25	316	10	4.9
	200	2.8		0.51	348	11	4.8
	800	11.2		2.02	440	19	4.8
Average of 4 Checks					380.5	8.5	

TABLE 3
Effect of Different Sources of Calcium and Magnesium Upon the Composition of Pineapple Orange and Excelsior Grapefruit Foliage.

Material	lbs./acre Applied	Percent of Dry Matter			
		Pineapple Orange Block		Excelsior Grapefruit Block	
		Ca	Mg	Ca	Mg
CaCO3	0	3.37	.179	3.24	.235
	400	2.30	.232	3.71	.229
	800	3.92	.163	3.09	.320
	3200	3.76	.194	3.25	.318
Dolomite	0	3.11	.179	3.36	.245
	400	2.57	.355	2.63	.391
	800	2.38	.528	2.86	.507
	3200	2.31	.520	3.26	.496
MgCO3	0	3.43	.175	3.00	.314
	200	2.88	.360	2.81	.450
	400	2.44	.682	2.41	.621
	1600	2.67	.920	2.16	1.054
MgSO4	0	3.35	.156	3.17	.212
	100	2.85	.352	2.91	.324
	200	4.05	.298	3.64	.309
	800	3.17	.500	2.61	.479
Average of 4 Checks		3.32	.172	3.19	.252

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LESS FRUIT — MORE MONEY

The Mission Times, published in the heart of the Texas citrus belt, says that the citrus interests of that state are anticipating higher returns for the citrus growers than during the past two seasons.

While predicting a lighter crop than last year or the year before, Texas shippers anticipate much higher prices than those received during the past two shipping seasons. This belief is based upon the greatly increased purchasing power of the consuming public and upon the better quality of the fruit produced. This belief is in line with that held by the vast majority of Florida growers and shippers.

As in Florida, the Texas crop is late in maturing and it is stated that little if any fruit will be shipped prior to October 15. Efforts are being made in Texas, as in Florida, to hold back shipments until the fruit is fully matured.

The general concensus of opinion among Texas shippers is that grapefruit growers should receive about 25 per cent higher prices than a year ago.

Early oranges in Texas are expected to exceed last year's volume slightly, but Valencias, it is thought, will be lighter in yield, so that the shipments of oranges, of which crop Texas produces only a limited supply, are expected to about equal last year's movement.

With the California crop about cleaned up by the time Florida oranges begin moving to market, growers here should be in position to demand and receive satisfactory prices for their fruit.

CITRUS CHANGES INDICATED

A recent statement issued by the United States Census Bureau indicates that Florida is steadily gaining ground on California in the volume of orange production. With the vastly greater number of young trees not yet in full bearing in Florida, it is reasonable to assume that within the next few years the relative positions of Florida and California in orange production may be reversed — that Florida may soon be the leading state in the volume of oranges produced and marketed.

In the grapefruit field, however, the trend is just the opposite. Texas, now running Florida a close second in the matter of grapefruit yield, has an enormous number of grapefruit trees not yet in full bearing; far exceeding Florida in this respect. When all of these young Texas grapefruit trees reach full bearing age, that state will have a potential, if not an actual, source of production in excess of Florida.

Barring some natural calamity, such as an excessive freeze, storm damage or insect pest, the production of both oranges and grapefruit may be expected to increase rapidly and to vast proportions. When all of Florida's young orange trees and all of the young grapefruit trees of Texas come into full bearing, present production will be enormously increased. When that time arrives, the growers of all the citrus producing states must be prepared to meet the increased production by creating an increased demand. One of the ways in which this may be done is by increasing the quality of the fruit. Another is by better controlled marketing systems. Still another is by expanding and bettering our merchandising and advertising activities.

Pertinent at this time and in this situation is the following from the September issue of the California Citrograph which is commended to the thoughtful consideration of Florida growers and shippers:

"Two factors principally explain the unprecedented demand for citrus fruits during recent weeks. One is obvious — the tremendously rapid increase in purchasing power of consumers. The other, more obscure, is the build-up effect of strong merchandising effort through consistent advertising. And the favorable influence of the weather must not be minimized.

"During periods of low purchasing power it is difficult to measure the effect of advertising and other methods of stimulating consumption of a particular product. There may be created in many individuals a desire to buy without that person or persons having the wherewithal to purchase. This creation of desire, if maintained through constant repetition, will generally result in purchases when the ability to buy has been met.

"Citrus growers have been wise in maintaining an intensive merchandising and advertising program. When purchasing power was low they did not slacken effort but fought to hold their own to explore every marketing possibility — although at times the full potentiality could not be realized.

"With the purchasing power of many millions of individuals increasing each day, that desire to buy created last year and the year before is being reflected in purchases of citrus fruits.

"The soundness of this reasoning seems apparent. There have been previous periods of high buying power in this country without such wide-spread demand for citrus fruits as now exists. The advantages gained should and will be followed up with even more intensive effort to saturate a market which in some respects has merely been tapped."

The grower's first concern should be to produce fruit that the trade demands; the second to see that it gets to the consumer through orderly channels.

Fall Clean-Up For White Flies And Scale Insects

By J. R. WATSON, Entomologist,
Florida Experiment Station

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The season is here when growers should be thinking of the fall clean up on their citrus trees which may be too heavily infested with scale insects and especially whiteflies. Although the cloudy-winged whitefly will be on the wing until November, the last brood of the common citrus whitefly, which is usually by all means the largest brood of the year, is now on the wing or has just disappeared in the southern part of the state. They will soon have laid practically all their eggs and in ten days after the disappearance of the brood of adult whiteflies practically all the eggs will have hatched. The young larvae of the whiteflies are small and easily killed. There is, too, another reason for killing them in the early stages of their life history, that is to prevent the drain on the trees which accompanies their growth. It is evident that the earlier the whiteflies can be killed the less damage they will do to the trees, so that the program that the Experiment Station has long advocated is to watch the flight of the adult whiteflies and when these have largely disappeared from the wing mark down the date, then wait ten days for the eggs to hatch. The average period for an egg to hatch is seven days so by waiting ten days one assures himself that practically all of the eggs have hatched. At the end of this ten days' period is a good time to spray. In other words, the last week or so in September or the early part of October is an especially good time to spray for the common citrus whitefly.

In groves where the cloudy-winged whitefly is the more abundant species often it will be well perhaps to wait a little later as this species is later in coming out than the species we have always called the common citrus whitefly. In some parts of the state, however, the cloudy-winged whitefly has during the last few years become the more abundant of the two, so the name common citrus whitefly is no longer entirely appropriate for **Dialeurodes citri.**

The proper spray to use, of course, is an oil emulsion. There are many brands of these oil emulsions on the market, containing variable amounts of oil, but in all cases of the less highly refined oils the amount of oil in the dilute spray should be 1% or 1½% of the emulsion, but 1% of the actual oil. Follow the directions on the containers in which they are purchased for dilutions.

These oil emulsions, if thoroughly applied, will at the same time clean up any infestations of scale insects on the trees. Perhaps we should say that an oil emulsion applied for scale insects at this time will also at this season clean up a whitefly infestation, since scale insects are much more of a pest than whiteflies especially in the southern part of the state. Since this is the last brood of the whiteflies, this season, if the trees are cleaned up at this time they will remain clean of whiteflies until the flight of the spring brood which usually occurs in March or April.

There are other reasons why the early fall is an especially good time to clean up citrus insects. The rainy season will soon end, which means that the entomogenous fungi, which do much good work in keeping down scale insects and whiteflies, will gradually become less efficient. Then to the fall of the year is the more convenient time to spray. One cannot spray trees when they are wet with dew or rain and with the less highly refined oils it is usually not safe to spray when the temperature is above 90 degrees F. If you subtract from the average **summer day those** hours when the trees are wet and those when the temperature is above 90 not a very long day is left for spraying. Later on in the season the citrus growers will be busy with picking and marketing activities and it is well to get this spraying out of the way before the busy season sets in. Furthermore a recently sprayed tree is more apt to be injured by cold, another reason for not delaying the spray too late in the fall, especially in the more northern parts of the citrus belt.

The spraying, of course, should be thoroughly done. In the case of whiteflies, particular attention must be given to the underside of the

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THE CITRUS SITUATION — PAST, PRESENT AND FUTURE

(Continued from page 5)

fane languages they speak.

October seventeenth, morning, afternoon and night, the Florida Canners' Association crowd will foregather at the Tampa Terrace Hotel and discuss the processed portion of t product. And that is the situation down to eight minutes past twelv o'clock, Eastern Standard Time, Monday, September eighth.

Grove owners naturally want to know "What shall the harvest be?" in both volume and returns, but that is not news. Charles Dickens wrote "I heard the bells on Christmas Day their old familiar carols play" and this narrator recalls the concern respecting the citrus outlook not unlike that now prevailing, which pervaded Florida during that other September, thirty-one years ago, when he first meddled with the industry. Maturity laws were lacking and the general theory as to shipping was "the devil take the hindmost" but supply had exceeded demand and the Florida Citrus Exchange decided that something should be done about it. Officered by the late great William C. Temple and the present great Robert P. Burton, Senior, the fledgling organization voted thirty thousand dollars for a national advertising campaign. Opening gun therein was the famous "poison telegram" incident, that yet holds the all-time high record for newspaper space stealing. Radio broadcasting was still in the future, or time also would have been stolen on an extensive scale. William H. Moody, then the Exchange district manager at Harrisburg, Penn., met a prominent department store man on the street and was asked, "Bill who is that fellow Siterus down in Florida the papers are talking so much about?"

Advertisements in periodicals inserted shortly afterwards on a cash basis contained nearly every vital argument for eating citrus which has been advanced since except the vitamins appeal and the claim that grapefruit seed salad will reduce flesh. Temple had given way to the lamented Doctor John H. Ross and Burton was succeeded by the much-missed Frank L. Skelly before the vitamin factor entered into the picture.

Working the clock around many a day for what he believed to be the industry's good, yours truly hung on until nineteen twenty-four, when a kick in the seat of the pants was swiftly, gracefully and efficiently administered by Lamarcus C. Edwards. Meanwhile, Charley Commander had come down from a Georgia town that used to be a good market for Kentucky mules and started wrapping oranges at the old Florence Villa packing house. Frank L. Carr, the manager, soon found that Commander had what it takes and began promoting him but probably never dreamed that eventually he would concentrate in one canny cranium the Burton brilliance, the Ross resourcefulness, the Skelly shrewdness and the Temple tenacity.

National Grange practices initially inspired all existing cooperative marketing endeavor in the United States and it is interesting to note how Commander has accepted the pioneer farm organization's conclusion that a small and satisfied membership is better than a large and grouchy one. In the subsequent years, he has worked with five presidents, namely Earl L. Wirt, clear-headed and far-sighted; the deceased William Edwards, whose potential usefulness was largely destoryed by unwise counsel; John A. Snively, Senior, able, active and argumentative; Judge W. Luther Tilden, grown up since this commentator was retired but from forbears numbered among the Lord's Elect and Incumbent Charles H. Walker, an arrival in Florida with old Ponce De Leon but who ieft the Fountain of Youth search and found the coveted waters all on his own . . .

What might currently be the citrus set-up in Florida if the appeal had been heeded which that "Noblest Roman of Them All" as to civic leadership, the departed Doctor William A. McKenzie, made so eloquently during nineteen twenty-four for united grower action supporting the Exchange? Expenses untold incurred in forming one group after anothe would have been saved, it is certain. Experiences such as the Plymouth Association, Orange county local unit, had last spring when a former independent shipper voluntarily applied for membership covering his grove holdings, probably would have been many times duplicated.

MISS KEOWN RECOVERING

Miss Mary E. Keown, state home demonstration agent, is rapidly recovering from minor injuries she received in a recent motor accident in Marion County.

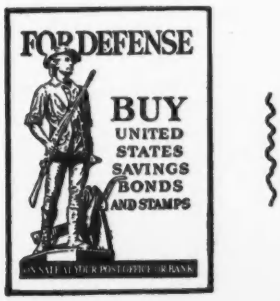
FALL CLEAN UP FOR WHITE-FLIES AND SCALE INSECTS

(Continued from page 7)

leaves as this is where the larvae are found exclusively. The purple scale is liable to occur on both surfaces of the leaves as well as on the twigs and fruit. The Florida red scale is usually on the upper side of the leaves and fruit. Therefore, to give a good kill of all these pests a thorough coverage is necessary. An oil emulsion will also kill any rust mites hit, but will not give as long a protection against rust mites as will lime-sulphur, or any other compound containing sulphur which remains active longer than an oil emulsion.

Oil emulsions should not be applied within two weeks of an application of lime-sulfur as the combination of oil and sulfur on the leaves is liable to cause serious burning. For these reasons, then, late September and early October is an excellent time to give a clean up spray for whiteflies and scale insects. The rainy season is drawing to a close, making spraying more parcticable. The weather is cooler and there is less danger of burning the fruit. Entomogenous fungi cannot be depended upon to control whiteflies and scale insects during the dry part of the year. It is well to get this work out of the way before the picking season begins, or the time for disking groves.

However, there is one exception to the statement that this is a good time to apply an oil emulsion spray. The exception is early ripening fruit. An oil spray may delay the ripening of the fruit for a time and interfere with coloring. In the case of early varieties which it is desirable to market as early as possible: Hamlins, satsumas, early varieties of grapefruit, etc., this delay in maturity may be very undesirable. It is therefore recommended that early maturing varieties should not be sprayed with oil emulsions until the fruit has been picked.



THE MINERAL COMPOSITION OF CITRUS JUICES AS INFLUENCED BY SOIL TREATMENT

(Continued from page 7)

applied to either oranges or grapefruit. The largest increase over the checks occurred where the supply of exchangeable magnesium was the greatest; that is, where magnesium carbonate was applied. However, on the basis of equivalent applications of magnesium the increase obtained with magnesium sulfate is of about the same magnitude. The composition of foliage (Table 3) and the composition of the juice (Tables 4 and 5) show very good agreement in respect to the absorption of magnesium.

Discussion

The large amounts of materials that must be applied to the soil to produce the relatively small increase in the mineral composition of the juice herein presented probably are not warranted in practical grove culture. The improved physical condition of the tree as indicated by an abundance of normal foliage is obtained by comparatively small applications of magnesium where there is no acute deficiency. The greatest improvement in the general flavor of fruit is found in conjunction with a high content of such organic compounds as sugars, citric acid, and vitamin C (1) which apparently have their origin in the assimilating mechanism — the foliage — of the the trees. As a consequence, cultural practices which produce and maintain a dense foliage condition of the trees should result in the best quality fruit. Since the mineral composition of the fruit juice is not greatly increased with normal applications of calcium and magnesium, it appears that increased yield is the principal way by which a tree converts more minerals into fruit. And insofar as the effects upon human nutrition are concerned, the best way to obtain the beneficial effects from orange juice is to drink more of it, thereby enhancing the assimilation of minerals from other foods that contain more of them.

Since the data do not indicate a definite response of foliage and juice composition of both varieties of citrus to calcium applications ($CaCO_3$ and dolomite) on sandy soils, it does not appear advisable to use this element in greater quantities than are necessary to reduce the acidity of the soil to about pH 6.0 in order

TABLE 4
Effect of Different Sources of Calcium and Magnesium Upon the Composition of Pineapple Orange Juice.

Material	lbs./acre Applied	mg. in 100 ml. juice				
		N	P	K	Ca	Mg
$CaCO_3$	0	99	13.2	248	7.75	11.1
	400	102	18.0	235	7.75	9.9
	800	95	17.4	241	8.50	10.3
	3200	97	17.3	247	9.25	10.4
Dolomite	0	104	16.1	259	7.50	9.9
	400	98	18.0	266	7.75	12.1
	800	95	19.0	263	8.00	13.9
	3200	80	17.2	257	9.00	13.5
$MgCO_3$	0	103	16.9	257	9.00	11.8
	200	99	20.0	281	8.75	14.9
	400	92	19.2	277	8.50	15.1
	1600	104	14.5	296	6.25	18.4
$MgSO_4$	0	104	16.9	254	8.50	10.9
	100	110	15.9	261	8.75	11.2
	200	96	16.4	244	8.00	12.6
	800	99	13.8	264	7.50	12.7
Average of 4 Checks		103	15.8	254	8.19	10.9

TABLE 5
Effect of Different Sources of Calcium and Magnesium Upon the Composition of Excelsior Grapefruit Juice.

Material	lbs./acre Applied	mg. in 100 ml. juice				
		N	P	K	Ca	Mg
$CaCO_3$	0	106	19.2	214	7.75	10.8
	400	88	16.3	194	7.50	10.2
	800	94	17.7	210	8.50	9.6
	3200	86	16.4	206	7.25	9.9
Dolomite	0	104	18.5	214	8.00	10.3
	400	95	17.6	218	8.00	11.8
	800	97	18.6	227	7.00	11.8
	3200	97	19.6	217	8.75	12.5
$MgCO_3$	0	99	16.3	213	7.25	11.1
	200	99	20.0	216	7.75	12.7
	400	95	18.3	214	7.50	15.2
	1600	93	18.9	206	6.00	18.9
$MgSO_4$	0	99	16.3	206	6.75	10.9
	100	105	19.5	226	8.00	12.1
	200	100	18.1	215	7.75	11.1
	800	102	19.8	241	8.00	13.6
Average of 4 Checks		102	17.6	212	7.44	10.7

that some of the bases added in the fertilizer may be held in the exchangeable state (3). Although such an amount of calcium is justified upon the basis of the improved physical condition of the soil itself, there is no evidence in these data that a greater absorption by the tree or fruit occurs with this small amount. The application of large amounts of calcium carbonate causes fixation of such elements as copper, zinc, and manganese in the soil (3). The discrepancy noted between the calcium absorption by foliage of trees on hammock soils and foliage of those on sandy soils apparently is due to the nature and amount of calcium present in the former soils or to the need for a longer period than three years in which to get the response in groves on sandy soils. To date the experiments at the Citrus Station indicate that the improved physical condition of the trees has occurred only where magnesium has been applied, irrespective of an increase or decrease in the calcium content of the soil or the foliage. The response obtained from magnesium applications to the soil is verified by distinct increases in the magnesium content of the foliage. When the magnesium content of the foliage becomes very large, the amount foun in the juice increases to a level which is above that found in the juice of fruit from any of the groves in the survey. From the data on the plots at the Citrus Station it is apparent that we have not been able to even "mineralize" the foliage; that is, to increase the total mineral or ash content. We have, however, been able to appreciably change the Ca:Mg ratio in the foliage.

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REITZ RETURNS TO TEACH AFTER GRADUATE STUDIES

After two years' leave of absence for graduate study, Dr. Wayne Reitz has returned to the University of Florida College of Agriculture to resume his duties of associate professor of agricultural economics, according to Dean H. Harold Hume.

Dr. Reitz studied at the University of Wisconsin and was awarded the doctor of philosophy degree by that institution in June.

Tests Are Conducted To Determine Possibility Of Improving Citrus Yields By Means Of Bud Selection

By S. H. YARNELL and W. H. FRIEND, Texas Agricultural College and A. and M. College of Texas in Citrus Fiesta Edition of the Mission, Texas, Times.

In considering the possibility of improving yields by means of bud selection it is important to distinguish between improving the yielding capacity of a grove and of a variety. The results of several workers in the United States Department of Agriculture, lead by A. D. Shamel, with several types of citrus fruits in California, have shown conclusively that bud sports of mutations that tend to

(Continued on page 18)

The LYONIZER

Department

COMPILED BY THE LYONS FERTILIZER CO.

Reports of Lyons Field Men . . .

POLK & HIGHLANDS COUNTIES
J. M. (Jim) Sample

This area is now getting some fine rains and with cooler weather approaching, the early fruit is getting closer to maturity. Grapefruit is juicing up and many growers believe that they will start moving fruit about the middle of October. Trees are putting on some fall growth since the rains but the amount of growth is dependent, usually, upon the amount of summer growth these trees put on; that is, trees that put on a good summer growth are not getting a full fall growth. Many of our customers will start with their application during early October, and will add secondaries as are needed. There is a general feeling that higher percentages of nitrogen can be used to good advantage along with copper on trees that are now showing signs of hunger.

WEST CENTRAL FLORIDA
E. A. (Mac) McCartney

Rains have been fairly general throughout this section and growers are going into the fall season with moisture conditions of the soil in fine condition. We are having a general infestation of rust mite throughout the section and growers are controlling these insects with sulphur dusts or sprays. Buyers are beginning to show an interest in the early varieties of oranges but I havent' heard of any definite sale to this date. In the vegetable sections there is a great deal of interest being shown in the shortage of labor. Most growers are very hesitant about increasing their fall acreage of vegetables for fear of an inability to obtain sufficient help.

SOUTHWEST FLORIDA
F. W. (Felton) Scott

Citrus fruits in general are sizing up well and the quality at this time of the year looks very good. Most growers, anticipating a better market, have sprayed and dusted very thoroughly in an effort to produce quality fruit. Fruit is slow in maturing throughout this section and it now appears that it will be rather late this fall before any fruit will be moving to the market. There is a noticeable shortage of tangerines, common grapefruit and seedling oranges in this territory. Vegetable growers in the Ruskin and Manatee sections have had some difficulty in getting their plants to live due to excessive rains and hot sunshine. The last few days have brought cooler weather however, and barring further mishaps, growers will have their fall crops well under way.

HILLSBOROUGH & PINELLAS COUNTIES
C. S. (Charlie) Little

The rains of the past few weeks have been very beneficial and groves throughout this territory are in good condition. Of course there are execptions but this has been caused by an insufficient amount of fertilizer or some other cultural practice. Fruit buyers are beginning to move around to see the growers regarding their fruit. It looks as if it will be Oct. 15th before very much fruit moves from this territory. In many groves the fruit isn't sizing up very fast but with the rains of recent weeks we should see this size condition improved.

NORTH CENTRAL FLORIDA
V. E. Bourland

In this section we hear reports from all over the state about the short crop of fruit. Up here we get two kinds of reports. There are sections where the fruit crop is alomst normal and of course growers in that section are of the opinion that the crop is almost normal. In other sections the crop is very light and of course those growers feel that the entire crop is small. It is definitely established however, that the common grapefruit crop is extremely light and that we have practically no tangerines at all. Groves are looking well in most cases, having had a fine summer growth and many of them are now putting on the early fall flush. We have had a constant fight with insects and diseases this summer, but most growers have been very busy with their spray machines and I am glad to report that the quality of fruit is a great deal above the average.

Horticultural Hints

If your cover crop has matured we suggest that you immediately cut it down and work into the soil. By cutting cover crop at this time you will materially reduce the hazards of pumpkin bug infestations. Furthermore by cutting at this time you will help control grasshoppers. We know of several instances where the grasshoppers were extremely bad and causing considerable damage to the trees. The cover crop has been cut and the birds have had a feast on the insects.

Last fall we saw several groves badly damaged by fire because the grove had not been properly protected. Those groves that adjoin property where fires might occur should be very thoroughly protected by plowing a wide fire guard around the property. Clean out all fence rows and ditch banks. Keep a careful watch for rust mites. They are active at this time and must be kept under control.

Groves that are breaking in color as a result of deficiency in nitrogen should be fertilized immediately. In this application should be included copper if neccessary and if the grove is showing magnesium deficiency we recommend that you include soluble magnesium. However, we have a man in your territory that will be glad to advise with you regarding these problems. Just call the LYONS FIELD MAN and he will be glad to advise with you.

If you have sick trees in your grove it would be well to remove them during the next few months and replace with healthy new trees in the very early spring. If you are prepared to heat grove in case of cold during the winter, this is just to remind you that the actual preparations should be made before the weather man tells us that it will be cold during the night.

Vegetable growers are urged to make liberal applications of fertilizer after these heavy rains. It is extremely important to keep all vegetable crops in a strong, healthy growing condition. Keep a careful check on diseases and insects and use proper control methods immediately on finding the trouble.

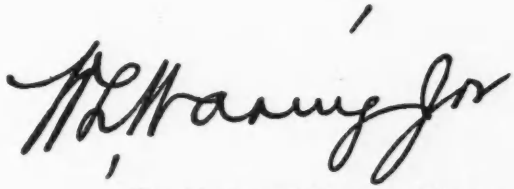
ONE THING most of us will never run short of is something to worry about . . . if it isn't the weather or the condition of the market or insects or the bank account, most of us can always, with practically no effort at all, find something else to worry about.

Right now with this world wide emergency playing hob with supplies and causing most of us to wonder what will happen next, we could if we wished devote practically all of our time to worrying about the situation. No one, under existing circumstances, if they are so disposed, need worry about running out of things to worry about.

—But after all, worry in itself, has seldom accomplished any purpose other than to lower one's efficiency and becloud one's mind, so instead of worrying it will be much more profitable for each of us, whether we be growers, manufacturers or what-not to sit down with ourselves and seriously think how we may best work out any problems which confront us.

An ounce of straight thinking and planning is better than a ton of of aimless worry . . . and about one of the most logical thoughts we can advance at the present moment is that it will be good busienss for us to produce the very finest fruit this season we have ever produced in order to get the maximum advantage from a market which promises to be exceptionally good this season.

—And, of course, the only way to produce such fruit is to feed and care for our trees in the very best manner we know of . . . naturally we believe that Lyons Fertilizers and the Lyonize plan will give results that will be most difficult to approximate in any other way.



President and General Manager,
Lyons Fertilizer Company

TESTS ARE CONDUCTED TO DETERMINE POSSIBILITY OF IMPROVING CITRUS YIELDS BY MEANS OF BUD SELECTION

(Continued from page 15)

reduce yields occur rather frequently in citrus. They are similar in the different groups of citrus and can be identified by the shape, size or quality of the fruit or by the "shade tree" type of tree. Since all of these bud variations or mutations that reduce yield can be readily recognized in fruit, they can be avoided by the nurseryman in his selection of budwood for propagation. Such selection of normal bud wood results in the improvement of the crop as compared to unselected wood but it does not increase the normal yielding capacity of the variety.

In order to find out if it is possible to secure high yielding strains of citrus, bud wood from both high and low yielding orchard trees was used to propagate a group of budling trees of each type. These were planted in adjacent rows and yield records kept of each individual tree. Seven paired high and low yielding selections were compared in this way. In four cases the trees propagated with budwood from the low producers gave more fruit over a 3 year period than did the trees budded from the heaviest producing trees available. The average production for the 7 high selections was 407.4 pounds per tree, while the average yield for the 7 low selections was 400.7 pounds per tree annually. In other words the potential productive capacity of the budwood from the low producers was practically as good as that from the high producers.

It is impossible to say, of course, that no one will ever find a citrus trees whose budling progeny would produce better than normal trees of the variety. The results of this experiment, when added to the results of similar experiments with other asexually propagated crops do show clearly that a superior yielding strain of grapefruit is very unlikely to be found by budding from high producing trees.

Since there is some variation in yields among orchard trees, it is important to know that bud wood taken from some of the lower producers that are otherwise normal will not result in a lower yield for the trees budded from it. On the other hand no one wants to pay a premium for trees of a "superior heavy producing strain" if such a thing does not exist.

Lest there be a possible misunderstanding about our results perhaps we should emphasize that these low producing trees whose progeny yielded as well as that from the high producers were normal in every way. Such differences in yield of individual trees in the same orchard can readily be accounted for by such things as soil variability, stock differences, as well as variation in available fertility and moisture supply. Care should always be exercised in securing budwood, to avoid a tree exhibiting abnormal fruit, unless the new type seems to have commercial value. But do not expect an increase in yield over that usually secured from the variety by this means.

CITRUS GROWERS WOULD NOT BENEFIT FROM BIG RISE IN PRICE LEVEL

A rise in the general price level similar to that of the first worl war period would be of little or benefit to the Florida citrus grower.

This was the opinion expressed by Dr. H G. Hamilton, agricultural economics professor in the University of Florida, at the recent eighth annual Florida Citrus Growers Institute at Camp McQuarrie.

Such a rise in the general price level, Dr. Hamilton pointed out, would raise the price of oranges an average of $1.60 a box, f. o. b., but anticipated production increases averaging 10 million boxes for the next five-year period, decreased purchasing power, and increased costs of grower supplies probably would absorb all this gain in price of oranges.

Dr. Hamilton based his statements and opinions on 30 years of records of United States production, prices, and general price levels.

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PLANT SOAR'S SWEET ORANGE trees for profit, fruit sells in September for $1.12½ to $1.50 per box. No losses from drops or frozen fruit, does not dry out on lemon. Pomona Nurseries, Dade City, Fla.

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Control Of Ants . . . In Home Or Yard

By A. N. TISSOT
Associate Entomologist, Florida Experiment Station

Thirty centuries ago King Solomon wrote: "Go to the ant, thou sluggard; consider her ways, and be wise." Ever since, and doubtless long before the time of Solomon, ants have been held up as examples of industry, prudence, and wisdom. These qualities, which in human beings are considered so admirable, are the very ones that make ants such pests about our homes and yards.

A little insight into the lives and habits of ants will help us to understand why this is true. Most ants live in rather large and well established colonies or nests. A typical colony consists of one to several females or queens, whose function is to lay eggs, and several hundred or even thousands of workers. At certain seasons there may be in addition, a few young winged females and males. These leave the nests or swarm and after mating the males die while the females seek out suitable situations and establish new colonies. The new queen lays a few eggs and takes care of the larvae or grubs that hatch from them. These develop into workers who take over all the work of the colony, and from then on the queen does nothing but lay eggs. Most of the eggs develop into workers, which are really sterile females, though a few become true males and females or "kings" and "queens." The queen may live only one or two years though some may live for as long as fifteen years.

The workers are the forms most commonly seen and the kings and queens are often conspicuous at swarming time. On the other hand, the egg laying queens and the immature stages are rarely seen unless a nest is dug up or the colony moves to a new location. The eggs of ants are very small, white, glistening objects. They hatch into thick-bodied, soft, white legless grubs, which when mature go into the pupa or nesting stage. The pupae aften are enclosed in a white cocoon, somewhat resembling a small bean. These cocoons sometimes are mistaken for eggs which are very much smaller.

Human beings are noted for eating almost everything, but the food of ants is even more varied than that of man. They eat particles of human food which they cut off and carry to their nests. They also are fond of sweets, fats, meats, honeydew, dead insects, fungi, seeds and parts of living plants. Some ants have very definite food preferences and no single species feeds on all the materials just mentioned. This preference for certain types of food is important from the standpoint of ant control.

People often wonder how ants happen to appear suddenly in enormous numbers where none were seen before. Among the workers in an ant colony are numbers of scouts which wander about in all directions from the nest. When a scout discovers a supply of suitable food, the news is somehow or other passed on to the nest of workers who organize a foraging exposition and begin to carry the food to the nest. The foraging ants which are swarming in and out of the sugar bowl or cookie jar are quite noticeable and disturbing to the housewife, but the single scout that discovered this bonanza and carried the good news to its fellow workers probably attracted no attention. Usually foraging ants follow definite trails which may be long and winding rather than direct from food supply to nest. If they are not disturbed this caravan probably will continue to move as long as the food supply lasts.

Control of ants may at times be surprisingly simple and easy but at other times it may be exasperatingly difficult. Two general methods of attacking them are available. They may be killed by exposing poisoned food materials where ants are seen, and they may be destroyed in their nests. In addition, certain precautions may be taken which will help to prevent ants from invading houses.

The simplest, though not the most dependable, thing to do when ants invade a house is to scatter in their trails some powder that will repel them, or to spray the travelling army and their path with a household insect spray. Among the powders that may be used are sodium fluoride, borax, or derris and pyrethrum dusts. Sodium fluoride usually is the most effective of these but it is poisonous to man and must be used with care. If the ant invasion has recently started these measures may serve to drive them away but if they have been coming for several days they probably will establish a new trail and continue their depredations.

The really thorough and effective method of ant control is to destroy the queens in the nest. Without the queens the other forms will die out and the colony will soon cease to exist. Often the entire colony can be destroyed at one operation by placing in the nest some material that is poisonous to ants. Two of the most effective materials for this purpose are carbon bisulfide and calcium cyanide. Carbon bisulfide is the heavy odorous liquid so commonly used in fumigating corn. Calcium cyanide is a dark gray substance which is sold in the form of coarse flakes or granules or as a fine powder. On exposure to the air it gives off hydrogen cyanide gas which is extremely poisonous to all animal life.

In applying these materials, punch one to several holes into the nest to a depth of six to twelve inches, depending upon the size of the nest. A sharpened stick or a cane serves very well. Then pour into each hole a tablespoonful of carbon bisulphide or calcium cyanide, plug the hole with moist soil and tamp it down. A wet feed or fertilizer sack or a piece of canvas thrown over the nest after treatment will help to confine the fumes and render the treatment more effective. When using these materials one must always keep in mind that carbon bisulphide fumes are explosive and that flames of all kinds must be kept at a distance. Calcium cyanide and the gas which it gives off are both poisonous to human beings and it must be handled with extreme care. If carbon bisulphide or calcium cyanide comes into contact with plants they may be injured or killed so it is well to use a funnel when placing the material in the nests. One should avoid using them in ant nests that are close to the base of valuable shrubs or other plants.

Sometimes it is difficult to find the nest of the ants but this usually can be accomplished by following the trail of the workers with food particles in their jaws. If the nest cannot be located or is not readily accessible a poison bait should be used. Most ant baits consist of food materials which are attractive to ants with some slow acting poison.

READ THE LYONIZER ON PAGES 16 AND 17

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C. E. Rubush, Lake Hamilton
Herman Schrader, San Antonio
J. C. Smith & Son, Lakeland
J. C. Smith & Son, Palmetto
Strickland Hardware Co., St. Cloud
D. T. Thompson, Webster
Unity Farms, Inc., Pahokee
G. E. Wetherington, Turkey Creek
Williams Cash Store, Dover

SALES REPRESENTATIVES

J. H. Rickborn, Sales Manager Lakeland
V. E. Bourland, Winter Garden
Chas. S. Little, Route 5, Box 1031, Tampa
E. A. McCartney, Temple Terrace, Tampa
J. M. Sample, P. O. Box 113, Lake Hamilton
Felton W. Scott, Bradenton
Norman Tuckett, Mount Dora

LYONIZE YOUR CROPS

The Citrus Outlook

. . . For 1942

The United States Department of Agriculture has issued the following review of the citrus outlook for the year 1942, which will be of special interest to citrus growers at the opening of the 1941-42 shipping season:

The Grapefruit Outlook For 1942

Grapefruit production in 1941-42 probably will be smaller than in 1940-41. The quantity of grapefruit canned probably will be about the same as in 1940-41, but the amount used for juice is likely to be less. If the crop materializes as now expected, the quantity of grapefruit taken by processing plants probably will be less this season than last.

Production of grapefruit in 1942-43 may be the largest on record, provided normal weather conditions prevail. If a record crop materializes, it is likely that the amount used by processing plants will also be of record size. A record crop of grapefruit, around 45 million boxes, in 1942-43 would probably sell at prices somewhat below those in prospect for the 1941-42 crop, but would be above average prices received for the 1940-41 crop.

Barring unusual damage to grapefruit trees from hurricanes or other disasters, production is likely to remain large for some time. While no substantial increase in bearing acreage is in prospect in the four main producing areas — Florida, Texas, Arizona, and California — about 65 percent of the bearing grapefruit trees in the United States have not yet reached the age of full production. The increased bearing surface of a large proportion of the trees will cause the upward trend in production to continue for a least the next 4 years. The total quantity of grapefruit placed in cans probably will increase along with production, but whether a greater portion of the crop will be canned than the 46 percent processed in 1940-41 is problematical. The generally higher level of consumer purchasing power in prospect is likely to increase the demand for fresh grapefruit.

The Orange Outlook for 1942

Present indications are that total orange production in 1941-42 will be slightly below that in 1940-41. A definite production forecast cannot be made at this time. Although production probably will be less than in 1940-41, it is anticipated that the amount processed will be roughly the same. Increased consumer demand in 1941-42 over that in 1940-41, and a smaller crop, will be favorable factors affecting orange prices.

Normal growing conditions in 1942-43 would result in an orange crop of record proportions, perhaps 5 million boxes greater than the record crop of 1940. Even if a crop of this size materializes, it is unlikely that the quantity of oranges used for fruit juices and various by-products will be increased over that used for similar products in 1940-41. The expected increase in the incomes of consumers is a price-stimulating factor that will offset to some extent the indicated larger orange crop.

It does not seem likely that the acreage in bearing orange trees will increase to any great extent during the next few years. The Bureau of the Census indicated that in California the total number of navel and miscellaneous orange trees of bearing age in 1940 was about the same as in 1930, but that the number of bearing Valencia trees in 1940 was considerably greater than in 1930. The present orange acreage is capable of producing an average crop during the next few years of 80-85 million boxes under average growing conditions and with reasonable care. The production of Valencias and other late varieties is expected to increase at a faster rate than that of early and midseason varieties. More late variety than early variety trees have been planted in the last 20 years, and as a result an increasing portion of the orange crop has been marketed in the relatively high-price months (March to September).